Section 2.7

CLIMATE CHANGE

2.7 Climate Change

As climate change was not a recognized concern at the time, the 1994 EOMSP EIR did not discuss climate change. However, climate change is now recognized as a major environmental issue. In response to this fact, it is appropriate to consider the impacts of the proposed project with respect to climate change.

This section provides an overview of the regulations and state policies that specifically address climate change and GHG emissions, and evaluates the potential effects on global climate as a result of the implementation of the proposed project. This overview is based on a technical Climate Change Analysis prepared by Urban Crossroads (2010c) which is included in Appendix O of this EIR.

2.7.1 Existing Conditions

Background

Global Climate Change (GCC) is defined as a significant change in climate over time, including temperature, wind patterns, precipitation, and storms. Climate change is generally considered to be a result of the accumulation of Greenhouse Gas (GHG) emissions in the atmosphere, which increase atmospheric temperatures by allowing solar radiation to enter the Earth's atmosphere but prevent heat from escaping. Concentrations of GHGs have been rising over the last 200 years as a result of increased human activity and industrialization. Increased emissions of GHGs are generally associated with new development due to increases in vehicular use, energy use, and other resource use.

Greenhouse Gas Composition

Water vapor, CO_2, methane (CH_4), nitrous oxide (N_2O), fluorinated gases (hydroflurocarbons [HFCs], perfluorocarbons [PFCs], and sulfur hexafluoride [SF_6]), and aerosols are collectively referred to as GHGs. These gases are emitted through both human activities and natural processes, as outlined below. Without the effects of naturally occurring GHGs, the earth's surface would be about 61°F cooler than present conditions. GHGs also are emitted into the atmosphere by human activities, however, such as electricity production and vehicle use. The addition of these non-natural GHG sources is largely responsible for the global warming that has occurred over the past 200 years.

Measuring GHGs

In order to measure the effect of GHGs on global warming, scientists have developed a unit of measurement referred to as global warming potential (GWP). The common unit of measure for GHGs is a terra gram (Tg); one Tg is equivalent to one million metric tons. The reference gas for GWP is CO_2, which has a GWP of one and is referred to as CO_2equivalent or CO_2e. GWP ranges from 1 for CO_2 to 23,900 for S_6F.

GHG Health Risks

The potential health effects associated directly with the emissions of GHGs, as they relate to development projects, are still being debated. Their cumulative effects on GCC have the potential to cause great harm to human health. Increases in the Earth's ambient temperatures, for example, would result in more intense heat waves, causing more heat-related deaths. Scientists also fear that higher ambient temperatures would increase disease survival rates, and result in more widespread disease. Climate change will likely cause shifts in weather patterns, potentially resulting in devastating droughts and food shortages in some areas. Droughts could also increase the risk of wildfires.

Existing GHG Levels

In 2004, total global GHG emissions were estimated at 20,135 Tg CO_2e, excluding emissions/removals from land use, land use change, and forestry. In 2004, the U.S. contributed the most GHG emissions of any country (35 percent of global emissions). In 2004, GHG emissions in the U.S. were 7,074.4 Tg CO_2e, which is an increase of 13 percent from 1990 emissions.

California is a substantial contributor of global GHGs. It is the second largest contributor in the U.S. and the sixteenth largest in the world (AEP 2007). In 2004, California produced 492 Tg CO_2e, which is approximately 7 percent of U.S. emissions. The major source of GHG in California is transportation, contributing 41 percent of the state's total GHG emissions. Electricity generation is the second largest source, contributing 22 percent of the state's GHG emissions.

In 2006, San Diego County emitted 34 Tg CO_2e, increasing by 5 Tg CO_2e from 1990 level emissions. This increase in GHG emissions is attributed to regional population growth, which increased at a rate of 18 percent over the 16-year period. In San Diego County, 46 percent of cumulative GHG emissions are generated by on-road transportation. Electricity generation and natural gas combustion produce 25 percent and nine percent of GHG emissions, respectively.

GHG Sources

GHG emissions associated with development similar to the proposed project are typically related to three primary sources: (1) construction emissions, (2) stationary-source operational emissions, and (3) mobile-source operational emissions. Construction GHG emissions are typically broken down into three categories: (1) heavy construction equipment, (2) construction worker vehicle miles traveled (VMTs), and (3) construction water use. Stationary-source operational GHG emissions related to development projects typically include electricity, water consumption, and solid waste generation. Mobile-source operational emissions are the result of increased project-related motor vehicle activity.

Regulatory Framework

International Guidelines, Policies and Regulations

The U.S. and other countries signed the United Nations Framework Convention on Climate Change (UNFCCC) in 1992, with the goal of controlling GHG emissions. Under the Convention, governments gather and share information on GHG emissions, national policies, and best practices; launch national strategies for addressing GHG emissions and adapting to expected impacts, including the provision of financial and technological support to developing countries; and cooperate in preparing for adaptation to the impacts of climate change. As a result of the UNFCCC, the U.S developed a Climate Action Plan to address GHG reduction, with this plan currently including more than 50 voluntary programs.

The Kyoto Protocol is a treaty made under the UNFCCC, and was the first international agreement to regulate GHG emissions. It has been estimated that if the commitments outlined in the Kyoto protocol are met, global GHG emissions could be reduced by an estimated five percent from 1990 levels during the first commitment period of 2008-2012. While the U.S. is a signatory to the Kyoto protocol, Congress has not ratified the agreement, and the U.S. is not bound by the related commitments.

The Montreal Protocol stipulates that the production and consumption of compounds that deplete ozone (O_3) in the stratosphere were to be phased out by 2000 (except methyl chloroform, which was to be phased out by 2005). The Montreal Protocol has been signed by the United States.

Federal Guidelines, Policies and Regulations

The USEPA does not currently regulate GHGs. While no federal legislation or regulations currently exist relative to GHG, several policies/actions have been taken on the federal level that are relevant to GHG emissions. Most recently, in March 2007 the U.S. Supreme Court ruled that the USEPA should be required to regulate CO_2 and other GHGs as pollutants under the Clean Air Act. Subsequently in May 2007, an Executive Order was signed to direct four federal agencies: the USEPA, the Department of Transportation, the Department of Energy, and the Department of Agriculture, to develop regulations limiting GHG emissions from new mobile sources. The USEPA has not developed a regulatory program for GHG at this time, amid speculation that congressional action on GHCs is pending. While such legislation has not been forthcoming, the noted Supreme Court decision paves the way for future federal regulation.

To date, the U.S. strategy has integrated actions to address climate change into a broader agenda that promotes energy security, pollution reduction, and sustainable economic development. As such, the majority of policies in place that specifically address climate change are voluntary and non-binding.

State Guidelines, Policies and Regulations

While global climate change did not become an international concern until the 1980s, efforts to reduce energy consumption began in California in response to the oil crisis of the 1970s. This

resulted in the unintended reduction of greenhouse gas emissions through efforts such as AB 1575, which created the California Energy Commission (CEC) in 1975, and Title 24 Standards as outlined below.

Although not originally intended to reduce GHG emissions, implementation of California Code of Regulations Title 24 Part 6, California's Energy Efficiency Standards for Residential and Non-residential Buildings, helps reduce GHG by reducing energy consumption. It is estimated by the CEC that consumers have saved $15.8 billion on utility bills since 1978 as a result of Title 24, indirectly resulting in a reduction in GHG emissions that would otherwise result from increased energy use. Title 24 standards are periodically updated to allow for the consideration and implementation of new energy-efficient technologies.

California Assembly Bill (AB) 1493, enacted in 2002, identified global warming as a matter of increasing concern for public health and the environment in California, and cited associated risks including reduced water supplies, increased air pollution, reductions in agricultural production, and related economic concerns. AB 1493 specifically required the California Air Resources Board (CARB) to develop and adopt regulations that reduce GHGs emitted by passenger vehicles and light duty trucks, with these regulations applying to 2009 and later model year vehicles. CARB estimates that the regulation will reduce climate change emissions from the light duty passenger vehicle fleet by 18 percent in 2020, and by 27 percent in 2030.

Executive Order S-3-05, established in 2005, identified the fact that California is vulnerable to potential climate change impacts, with related concerns including reduced snowpack levels in the Sierras, air quality deterioration, and rising sea levels. Specific GHG emission reduction targets were identified as follows: (1) reduce emissions to 2000 levels by 2010; (2) reduce emissions to 1990 levels by 2020; and (3) reduce emissions to 80 percent below 1990 levels by 2050. A Climate Action Team (CAT) was established to address these goals, with the first (2006) associated annual report proposing to build on existing voluntary programs as well as to implement state incentives and regulatory requirements.

The California State Legislature adopted AB 32, The California Global Warming Solutions Act of 2006. AB 32 requires CARB to adopt rules and regulations that would achieve GHG emissions equivalent to 1990 statewide levels by 2020. AB 32 establishes a multi-year timeline for the development and implementation of GHG reporting and mitigation policy. The first step was the development of so-called "early actions" measures, published in October 2007 as the "Expanded List of Early Action Measures to Reduce Green House Gas Emissions in California Recommended for Board Decision." Included measures represent discrete opportunities to achieve GHG reductions that are proposed to take effect by January 1, 2010. AB 32 also includes guidance to implement emission reductions in an economically efficient manner, and to ensure that business and consumers are not unfairly affected.

In addition, AB 32 stipulated that CARB establish 1990 statewide GHG emission levels by January 1, 2008. In December 2007, CARB determined the average statewide GHG emissions level in 1990 to be 427 Tg CO_2e. Emission sources by sector were identified as: transportation, 35 percent; electricity generation, 26 percent; industrial, 24 percent; residential, 7 percent; agriculture, 5 percent; and commercial, 3 percent. Accordingly, 427 Tg CO_2e was established as

the emissions limit for 2020. For comparison, CARB's estimate for baseline GHG emissions was 473 Tg CO_2e for 2000 and 532 Tg CO_2e for 2010. Business as usual (BAU) conditions (i.e., without the 30 percent reduction to be implemented by CARB regulations) for 2020 were projected to be 596 Tg CO_2e. BAU typically refers to emissions that would be generated prior to the implementation of 2006 emissions restrictions and updated standards (e.g. 2005 Title 24 standards).

In December 2007, CARB approved a regulation for mandatory reporting and verification of GHG emissions for major sources. This regulation covered major stationary sources such as cement plants, oil refineries, electric-generating facilities/providers, and co-generation facilities, which comprise 94 percent of the point source CO2 emissions in the State. In December 2008, CARB adopted a scoping plan to reduce GHG emissions to 1990 levels. The Scoping Plan's recommendations for reducing GHG emissions to 1990 levels by 2020 include emission reduction measures, including a cap-and-trade program linked to Western Climate Initiative partner jurisdictions, green building strategies, recycling and waste-related measures, and Voluntary Early Actions and Reductions. CARB has until January 1, 2011 to adopt the necessary regulations to implement the scoping plan, and is currently drafting associated regulations. Implementation of individual measures must begin no later than January 1, 2012, so that the emissions reduction target can be fully achieved by 2020.

Pursuant to SB 97, the CEQA Guidelines were modified to include criteria for GHG emissions on January 1, 2010. The new guidelines do not identify a numeric threshold of significance for GHG emissions, nor do they prescribe assessment methodologies or specific mitigation measures. Instead, they state that a lead agency shall have discretion to determine whether to use a quantitative model or methodology, or in the alternative, to rely on a qualitative analysis or performance based standards. Additional discussion of the current CEQA Guidelines related to GHG emissions, including recommendations by CARB and local air districts, is provided in Section 1.4 of Appendix O.

A number of additional requirements related to efforts such as building and appliance energy use, diesel fuel emissions, tire replacement/inflation, and transportation efficiency have implemented by the State of California, as described in Section 1.4 of Appendix O.

Local Guidelines, Policies and Regulations

The County of San Diego currently has no adopted guidelines, policies, or regulations governing GHGs. However, it is in the process of developing a comprehensive strategy to enhance sustainability while updating the General Plan to include a climate change action plan and regulations and procedures to encourage "green building" and energy recovery programs. The implementation of the General Plan Update is based on smart growth and land planning principles that will result in a reduction of GHG emissions. Specifically, the climate change action plan will include baseline inventory and emissions reduction targets for GHGs from all sources.

2.7.2 Analysis of Project Effects and Determination as to Significance

2.7.2.1 *Climate Change*

Guidelines for the Determination of Significance

The proposed project would result in significant, direct impacts related to climate change if it would:

1. Be adversely affected by manifestations of climate change including exacerbation of air quality problems; a reduction in the quality and supply of water to the state from the Sierra snowpack; a rise in sea levels resulting in the displacement of coastal businesses and residences; damage to marine ecosystems and the natural environment; and/or an increase in the incidence of infections, disease, asthma, and other health-related problems, or
2. Generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment

The County has not formally adopted climate change thresholds. However, Section 15064.4 of the CEQA Guidelines provides guidance that has been used here. Guideline 1 is derived from AB 32, section 38501(a). Guideline 2 comes from CEQA Appendix G, Environmental Checklist Form.

Analysis

Effects of Climate Change on the Proposed Project (Guideline 1)

Potential global warming effects include exacerbation of air quality problems; a reduction in the quality and supply of water to the state from the Sierra snowpack; a rise in sea levels resulting in the displacement of coastal businesses and residences; damage to marine ecosystems and the natural environment; and an increase in the incidence of infections, disease, asthma, and other health-related problems (AB 32, section 38501[a]). Specifically, higher temperatures would be expected to increase the frequency, duration, and intensity of conditions conducive to air pollution formation, potentially including the use of increased electricity to cool buildings that would result in an increase of indirect air emissions.

The impact of increased air pollution on persons that would work at, or patronize, the proposed shopping center, however, would not be any greater than what those individuals would be subject to in areas outside the proposed project. That is, increased air pollution resulting from global warming would generally affect the entire region, and would not be focused, or more severe, at the project site. Similarly, health-related problems associated with climate change would be widespread, and not directly associated with the project site or employees/patrons. Accordingly, proposed project operations would not be significantly affected by increased air pollution or health risks, relative to other local or regional locations.

Rising temperatures would also potentially affect water supply, with related impacts on retail development primarily affecting landscape irrigation and restaurant operations. Because neither of these are essential water uses for proposed operations, the impact of reduced water supplies on the project would not be significant. Increasing global temperatures would also be expected to increase the frequency of wildfires. However, because this region has historically experienced a heightened fire threat due to its native vegetation and climate, regulations and plans are already in place to mitigate and avoid any potential effects of incremental increases due to climate change. Finally, based on the fact that the project site is located approximately 13 miles inland, and is at an elevation of approximately 500 to 600 feet amsl, it is unlikely that the proposed project would be threatened from rising sea levels. **Based on the above discussions, climate change impacts on the proposed project and its users would be less than significant.**

Effect of the Project on Climate Change (Guideline 2)

As shown in Table 2.7-1, the proposed project would generate 23,600.74 metric tons of GHG emissions per year (mtpy) CO2e through mobile-source, construction, energy use, water use, natural gas, and solid waste-related emissions. While project-related GHG emissions can be estimated, the direct impacts of such emissions on climate change and global warming cannot be determined on the basis of available science. There is no evidence at this time that would indicate that the emissions from an individual project of this size would directly affect global climate change. Individual projects are not anticipated to generate sufficient emissions to have a significant direct impact on global climate change. **Thus, the project would have a less than significant impact with respect to climate change.**

2.7.3 Cumulative Impact Analysis

Climate Change

Guidelines for the Determination of Significance

AB 32 states, in part, that "[g]lobal warming poses a serious threat to the economic well-being, public health, natural resources, and the environment of California." Because global warming is the result of GHG emissions, and GHGs are emitted by innumerable sources worldwide, GHG emission generation is considered to be an adverse environmental impact. GHG emissions from the project would contribute to cumulative GHG emissions in California and to the potential adverse environmental impacts of climate change.

According to its December 2008 Scoping Plan, CARB has determined that, absent AB 32 and other California climate change laws and mandates, California's projected 2020 GHG emissions would be 596 million metric tons carbon dioxide equivalent (MMTCO2e). This condition is referred to as the BAU condition. CARB has also determined that California's 1990 greenhouse gas emissions were 427 MMTCO2e. Accordingly, to satisfy the requirements of AB 32, California needs to reduce its overall 2020 emissions for all sectors by 169 MMTCO2e, or 28.3 percent below the BAU 2020 projection. Thus, it is assumed that individual projects should reduce their emissions by 28.3 percent below the BAU condition to conform with the goals of AB 32.

Based on the need for future development to reduce its GHG emissions to achieve 1990 levels, the project would have a significant cumulative climate change impact if it would:

3. Not reduce its GHG emissions by at least by 28.3% below that which would result under the BAU condition; or
4. Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases.

Analysis

Effects of Climate Change on the Proposed Project (Guideline 1)

The cumulative effects of climate change on the proposed project would be the same as discussed previously. **Based on this discussion, the cumulative impact of climate change on the proposed project would be less than significant.**

Effects of the Proposed Project on Climate Change (Guidelines 2 through 4)

As shown in Table 2.7-1, in the BAU scenario, the proposed project would generate 23,600.74 metric tons of GHG emissions per year (mtpy) CO2e through mobile-source, construction, energy use, water use, natural gas, and solid waste-related emissions. Constructing and operating the project per BAU standards would conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases, namely the CARB scoping plan developed to implement AB 32, which requires a 28.3 percent reduction below BAU from all sectors in order to reach 1990 levels by 2020. **Thus, the project could have a significant cumulative impact with respect to climate change. (Impact CC-1)**

2.7.4 Significance of Impacts Prior to Mitigation

Based on the analysis provided above, the proposed project would have the following significant impacts prior to mitigation.

Impact CC-1: Without energy reductions over and above that required by Title 24, the project would not achieve the 28.3 percent reduction necessary to avoid significant cumulative impacts to climate change.

2.7.5 Mitigation

Implementation of additional energy conservation measures, as identified below (or the functional equivalent), would reduce the project's cumulative impact on climate change to less than significant. As illustrated in Table 2.7-1, compliance with the 2008 Title 24 and state-mandated reductions in GHG, in combination with additional measures to achieve an increased energy efficiency of 15 percent over Title 24 standards for a minimum of 25 percent of the gross leasable square footage, would result in the reduction of project emissions to 16,775.27 mtpy CO_2e (28.92 percent reduction). The ability of these measures to achieve the 15 percent reduction required to reduce the project emissions by at least 28.3 percent is illustrated in

Table 2.7-2. A GHG emission reduction of 28.3 percent is required to reach 1990 GHG levels according to the CARB Scoping Plan (2008).

M-CC-1: CLIMATE CHANGE: [DPLU, PCC] [DPR, TC] [DGS, RP] [BP, UO] [DPLU, FEE X 2]. Intent: In order to reduce the project's cumulative impact on climate change to less than significant, at least 25% of the gross leasable floor area within the project shall be required to achieve energy efficiency 15% above the level required by the applicable 2008 California Title 24 Energy Efficiency Standards. This will bring the project's greenhouse gas emissions to 28.3% below Business As Usual and achieve 1990 levels in accordance with AB32 (CARB Scoping Plan, 2008). **Description of Requirement:** The energy efficiency of the buildings specified on the approved Site Plan, comprising 25% of the gross leasable space, shall adopt additional energy conservation measures in order to surpass the 2008 California Title 24 Energy Efficiency Standards by at least 15%. Potential measures to be taken may include, but are not limited to:

1. Building Envelope: Designing roof, walls, and fenestration assemblies to exceed the maximum U-factors prescribed by Title 24 to reduce heating, ventilation, and air conditioning system loads.
2. Lighting: Designing indoor and outdoor lighting with lower lighting power densities.
3. Mechanical: Install cooling systems that are Energy Star certified and exceed the minimum efficiency requirements of Title 24 to reduce cooling energy use.

Documentation: The Project Applicant shall prepare Title 24 Compliance Reports documenting the additional 15% energy efficiency and submit them to *[DPLU, PCC]* for approval. **Timing:** Prior to issuance of the building permit for each of the buildings listed as "Buildings that will exceed Title 24 Energy Efficiency Standards by 15%" on the approved Site Plan, the Title 24 Compliance Report shall be submitted. **Monitoring:** The [*DPLU, PCC*] shall review the Title 24 Compliance Report for compliance with this condition.

2.7.6 Conclusion

The project's contribution to the cumulative impacts related to climate change (Impact CC-1) would be reduced to less than significant with implementation of Mitigation Measure M-CC-1 because the project's energy savings would reduce its GHG emissions to 1990 levels, as estimated by the CARB Scoping Plan.

Table 2.7-1
ESTIMATED PROJECT GHG EMISSIONS

Scenario	Source	CO_2	N_2O		CH_4	
		mtpy[1]	mtpy	mtpy CO_2e	mtpy	mtpy CO_2e
BAU	Mobile Source Emissions	20,410.67	1.99E+00	616.65	2.6E+00	54.68
	Construction Emissions[2]	201.85	1.43E-02	4.42	2.42E-02	0.51
	Energy Use Emissions	1,466.02	1.33E-02	4.14	6.01E-02	1.26
	Water Use Related Emissions	7.72	7.03E-05	0.02	3.16E-04	0.01
	Natural Gas Emissions	616.56	1.13E-02	3.50	1.18E-02	0.25
	Solid Waste Related Emissions	-	-	-	1.01E+01	212.49
	Total (mtpy)	22,702.81	2.03	628.74	12.82	269.18
	Total (mtpy CO_2e)	23,600.74				
Proposed Project with Reductions[3]	Mobile Source Emissions[3]	14,184.88	5,83E-01	180.85	8.61E-01	18.08
	Construction Emissions[2]	201.85	1.43E-02	4.42	2.42E-02	0.51
	Energy Use Emissions[4,5]	1,339.2	1.22E-02	3.93	5.71E-02	1.20
	Water Use Related Emissions	7.72	7.03E-05	0.02	3.16E-04	0.01
	Natural Gas Emissions	616.56	1.13E-02	3.78	5.49E-02	1.15
	Solid Waste Related Emissions	-	-	-	1.01E+01	212.49
	Total (mtpy)	16,350.21	0.62	192.57	11.07	232.49
	Total (mtpy CO_2e)	16,775.27				
Percent (%) Reduction		**28.92**				

Source: Urban Crossroads 2010c

[1]mtpy = metric tons per year, where a year indicates the average of summer and winter emissions; one teragram (Tg) is equivalent to one million metric tons.

[2]Amortized over a 30 year period.

[3] Percent Reduction from BAU calculated based on AB 1493 Pavely I and II which is expected to result in an approximate 20% reduction, and an additional 10% for Low Carbon Fuel Standard (LCFS) for a total reduction of approximately 30% from BAU for CO2 emissions only. For N2O and CH4 emissions only a 20% reduction for Pavely I and II has been applied since the LCFS applies to only CO2 emissions.

[4] Overall the new 2008 Title-24 Building Energy Standards are roughly 4.9% more restrictive than the previous 2005 standards they replace. And therefore will reduce electricity consumption by approximately 4.9% from BAU.

[5] Percent Reduction from BAU calculated based on exceeding 2005 Title 24 by 4.9% as a result of 2008 Title 24 requirements for all buildings, additionally, 25% of the gross leasable area (GLA) will exceed 2008 Title 24 by 15%, Please note that for modeling purposes only a 8.65% reduction was taken given that all buildings are required to adhere to 2008 Title-24 and only 25% of the GLA will be required to exceed 2008 Title-24 by 15%. Therefore, 25% of GLA x 15% reduction = 3.75% reduction for buildings exceeding Title-24 by 4.9% + all buildings adhereing to the 2008 Title-24 standards = 8.65% reduction in energy consumption. The use of HET and EPA Certified WaterSense labeled faucets will result in a 30% reduction in water use from BAU conditions. Based on the LEED ® for New Construction Reference Guide, the typical flowrate for a water closet is 1.6 gallons per flush, for a low-flow water closet the flowrate is 1.1 gallons per flush which is an approximate 30% reduction in water usage. Additionally, a conventional kitchen sink has a flowrate of 2.5 gallons per minute and a conventional shower has a flowrate of 2.5 gallons per minute; the low-flow kitchen sink has a flowrate of 1.8 gallons per minute and the low-flow shower has a flowrate of 1.8 gallons per minute this is an approximate 28% reduction in water usage.

Table 2.7-2
ADDITIONAL GHG EMISSION REDUCTIONS RESULTING FROM INCREASING ENERGY CONSERVATION BY 15 PERCENT MORE THAN 2008 CALIFORNIA TITLE 24 ENERGY EFFICIENCY STANDARDS

Category	Action	Percentage of Overall Building Energy Use	Unit of Measure	T24 Baseline	Proposed Design Value	% Energy Use Reduction	Contribution Towards Overall Energy Use Reduction
1. Building Envelope							
Wall	The exterior walls will meet the minimum requirements of T24 Section 143 and the overall wall assembly U-factor values will exceed T24 - U-factor .074 (~ R-19) instead of the minimum U-factor .110 (~R-13).	NA	U-factor	0.110	0.074	(Included in reduced cooling loads)	(Included in reduced cooling loads)
Roof	The roofs installed will be certified as "cool roofs" and comply with mandatory aged reflectance and emittance requirements of T24 Section 143. The overall roof assembly U-factor values will exceed T24 - U-factor .032 (~ R-30) instead of the minimum U-factor .067 (~R-19).	NA	U-factor	0.067	0.032	(Included in reduced cooling loads)	(Included in reduced cooling loads)

Table 2.7-2 (cont.)
ADDITIONAL GHG EMISSION REDUCTIONS RESULTING FROM INCREASING ENERGY CONSERVATION BY 15 PERCENT MORE THAN 2008 CALIFORNIA TITLE 24 ENERGY EFFICIENCY STANDARDS

Category	Action	Percentage of Overall Building Energy Use	Unit of Measure	T24 Baseline	Proposed Design Value	% Energy Use Reduction	Contribution Towards Overall Energy Use Reduction
Fenestra-tion	The fenestration will meet the minimum requirements of T24 Section 143 and will exceed the maximum U-factor and Solar Heat Gain Coefficient (SHGC) values. The high performance glazing will significantly reduce the buildings' cooling loads and reduce overall energy consumption.	NA	U-factor	0.77	0.28	(Included in reduced cooling loads)	(Included in reduced cooling loads)
			SHGC	0.61	0.38		
2. Lighting							
Indoor Lighting	The project's indoor lighting design will comply with all mandatory measures of T24 and will reduce the allowed lighting power density by 22% by installing high efficacy luminaires, and reducing the total installed watts by using lower wattage fixtures and reducing the total quantity of fixtures.	51.09%	watts / sf	1.6	1.25	-22%	**-11.2%**

Table 2.7-2 (cont.)
ADDITIONAL GHG EMISSION REDUCTIONS RESULTING FROM INCREASING ENERGY CONSERVATION BY 15 PERCENT MORE THAN 2008 CALIFORNIA TITLE 24 ENERGY EFFICIENCY STANDARDS

Category	Action	Percentage of Overall Building Energy Use	Unit of Measure	T24 Baseline	Proposed Design Value	% Energy Use Reduction	Contribution Towards Overall Energy Use Reduction
Outdoor Lighting	The project's outdoor lighting design will comply with all mandatory measures of T24, and proposes to reduce the allowed lighting power density by 8% by installing high efficacy luminaires, and reducing the total installed watts by using lower wattage fixtures and reducing the total fixture quantity.	12.31%	watts / sf	0.092	0.085	-8%	**-0.9%**
3. Mechanical							
Cooling	The cooling systems will be designed to maximize equipment efficiency and utilize controls to minimize unnecessary operation and simultaneous use of heating and cooling operational. Specifically, the design will utilize unitary rooftop equipment with a minimum 15 SEER rating. These high efficiency units	11.16%	SEER	≥ 15	13	-26%	**-2.9%**

Table 2.7-2 (cont.)
ADDITIONAL GHG EMISSION REDUCTIONS RESULTING FROM INCREASING ENERGY CONSERVATION BY 15 PERCENT MORE THAN 2008 CALIFORNIA TITLE 24 ENERGY EFFICIENCY STANDARDS

Category	Action	Percentage of Overall Building Energy Use	Unit of Measure	T24 Baseline	Proposed Design Value	% Energy Use Reduction	Contribution Towards Overall Energy Use Reduction
	combined with the building envelope strategies will reduce cooling energy use by approximately 26%.						
						Total Reduction	**-15.0%**

Source: Urban Crossroads 2010c